

Ultrasensitive Analyzer for Realtime, In-Situ Airborne and Terrestrial Measurements of OCS, CO₂, and CO, Phase I

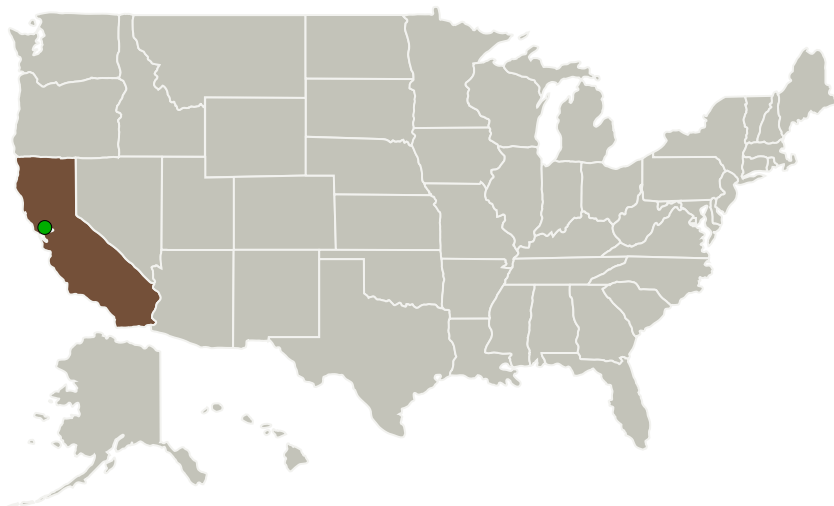
Completed Technology Project (2012 - 2012)



Project Introduction

In this Small Business Innovative Research (SBIR) effort, Los Gatos Research (LGR) proposes to employ its patented mid-infrared Off-Axis Integrated Cavity Output Spectroscopy (Off-Axis ICOS) technique to develop a compact OCS, CO₂, and CO analyzer. This sensor will provide rapid (up to 10 Hz), real-time, highly accurate (OCS, CO₂, and CO to better than plus or minus 20 pptv, plus or minus 0.2 ppmv, and plus or minus 5 ppbv respectively, 1 sigma at 1 Hz) measurements of these important trace gases with minimal calibration. The instrument will also report water vapor concentrations for calculations of dry mole fractions. Moreover, the SBIR instrument will be capable of both terrestrial and airborne deployments (e.g. DC-8, WB-57, ER-2, Alpha Jet...) to provide data in the troposphere, tropopause, and stratosphere. The resulting system will allow researchers in NASA's Earth Science Division to acquire data that complements satellite observations made from several missions in the Earth Observing System (EOS). The in-situ data will provide higher spatial resolution and vertical profiling near highly inhomogeneous OCS and CO₂ sources, helping to better understand stratospheric aerosol loading and gross CO₂ flux between plants and the atmosphere, both critical needs for improved climate modeling.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Los Gatos Research	Lead Organization	Industry	Mountain View, California
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California

Project Transitions

▶ **February 2012:** Project Start

✓ **August 2012:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140678>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Los Gatos Research

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

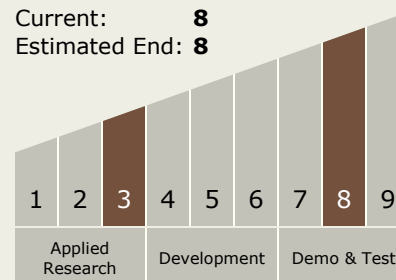
Carlos Torrez

Principal Investigator:

Manish Gupta

Technology Maturity (TRL)

Start: 3
Current: 8
Estimated End: 8



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
 - └ TX06.1.1 Atmosphere Revitalization

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System